AUTHOR INDEX

Andrews, S., 85

Banka, R. P., 157
van den Berg, L., 184
Bickis, I. J., 1
Blackwood, J., 33
Blakely, S., 209
Botterill, V., 209
Boyne, P. J., 341
Bray, V. F., 237
Brodine, C. E., 204
Bucher, O. M., 200

Callahan, A. P., 103
Carroll, P. M., 147
Cavins, J. A., 209
Chagnon, A., 197
Couture, B., 197

Damjanović, V., 30
Davidkova, E., 184
Dodds, R., 290

Fellowes, O. N., 223
Fennema, O., 329
Finn, J. J., 1
Fishbein, W. N., 283
Foley, C., 333
Freeman, A. E., 237
Fuson, R. L., 309

Geschickter, Charles F., 232
Graham, E. F., 75
Greiff, D., 295
Gross, W. O., 200

Hall, T. C., 209
Harrison, N., 290
Henderson, I. W. D., 1
Hirose, F. M., 97
Holm-Hansen, O., 17

Jung, G. A., 11

Kazaks, K., 1
Kensler, C. J., 333
Kessel, D., 209
Khan, A. E., 184
Kim, K. S., 61
Klavins, J. V., 309

Levitt, J., 85
Lin, J. H., 147
Luyet, B., 215

Malinin, T. I., 90, 104
Melnick, P. J., 136
Miller, J. A., Jr., 24
Mohler, W. C., 47
Moore, F. T., 33

Nei, T., 153, 303

Ostergard, D. R., 97
Ōtsuka, K., 165

Pace, M. M., 75
Pace, W. G., 33
Panuska, J. A., 157
Pappas, A. M., 204, 358
Pavilanis, V., 197
Perez-Colon, J., 157
Perry, V. P., 90, 104, 204
Pitts, H. R., 140
Powrie, W. D., 329
Price, P. J., 237

Radulović, D., 30
Rapatz, G., 215
Rink, R., 24
Romano, C. C., 317
Ross, H., 337

Sakai, A., 165
Sargent, M. G., 177
Schöpf-Ebner, E., 200
Seifert, P., 295
Sell, K. W., 133
Shelton, D. C., 11
Sherman, J. K., 61, 137
Sherman, M., 317
Shih, S. C., 11
Shingleton, W. W., 309
Shohet, S. B., 47
Sokolski, W. T., 174
Someda, K., 116
Stapert, E. M., 174
Stewart, G. J., 189
Stowell, R. E., 283
Sugg, W. L., 290
Sugiura, K., 177

Tortolani, A. J., 177
Townsend, D. E., 97
Turner, A. C., 140
Turner, H. M., 189
Turner, M. D., 140

Van Hulle, G., 329

Wax, S. D., 290
Webb, W. R., 130, 290
Weinstein, R. S., 116
Wheeler, T. E., 204
Wodinsky, I., 333
Won, W. D., 337

Yoshida, S., 165

Zimmy, M. L., 317

SUBJECT INDEX

Aerosols, microbial, behavior at −30°C, 337
Alfalfa, seasonal changes related to cold hardiness of, 11
Algae, lyophilized, factors affecting viability 17,
Asphyxia, resistance to in pouch-young opossums, 24

Blood cells, human red, ultrastructure after freezing, glycerolization, and deglycerolization, 189
Bone
  cryopreservation, 341
  nutrient media storage of marrow, 204
  storage by freezing and freeze-drying, 358

Cervicitis, cryotherapy for chronic, 97
Cryodenaturation of chicken myofibrillar proteins, 184
Cryopreservation (*see also* Preservation, low temperature)
  bone, 341
  human leukocytes, 209
  pulsatile activity of isolated heart muscle cells after, 200
  various solid and ascites tumors, 177
Cryotherapy
  chronic cervicitis, 97
  for malignant tumors, 33
Cryotolerance of selected sites on cell membrane surfaces, 295

Dimethyl sulfoxide
  effect on heart rate and cardiac arrest during progressive hypothermia, 157
  permeation kinetics in Novikoff hepatoma ascites cells, 1
  toxic effect on HeLa cells, 90
Dry Ice, short-term storage of tissue culture cells previously stored in liquid nitrogen vapor, 237

Enzymes, histochemical procedures in viability assay of tissues and organs, 136
Erythrocytes
  cryotolerance of mucopolysaccharides, 295
  hemolysis by freezing, 153, 303
  human, effects of freezing rates and protective agents, 215
Ethyl alcohol, protective effect in profound hypothermia, 290

Foot and mouth disease virus, cryobiological characteristics, 223
Freeze-cleaving, ultrastructure of frozen tissues, 116
  after, 30
Freezing
  bone, 358
Freeze-drying, survival of *Lactobacillus bifidus*
  biochemical changes in spermatozoa due to, 75
  gastric, alterations during repair of injury by, 309
  hemolysis of erythrocytes, 153, 303
  high pressure, 329
  kidney cells, for tissue culture, 197
  Lactobacillus leichmannii, 174
  rapid, of plant cells, 165
  Thiogel, 85
  uterus, with glycerol, 147
Freezing rate, effect on preservation of human erythrocytes, 215

Glycerol
  freezing and thawing of uterus in presence of, 147
  permeation kinetics in Novikoff hepatoma ascites cells, 1
Glycerolization, ultrastructure of human red blood cells after, 189

Heart muscle cells, pulsatile activity after freezing storage, 200
Heart rate, effect of dimethyl sulfoxide during progressive hypothermia, 157
HeLa cells, toxicity of dimethyl sulfoxide, 90
Hemolysis of erythrocytes by freezing, 153, 303
Hypothermia
  effect of dimethyl sulfoxide on heart rate and cardiac arrest during progressive, 157
  profound, protective effect of ethyl alcohol, 290
  ultrastructural modifications of intercalated disc during, 317

Injury
  freeze-thaw-induced, cellular ultrastructure in, 61
  induced by gastric freezing, alterations during repair of, 309
Intercalated disc, ultrastructural modifications during hypothermia, 317

Kidney
  freezing cells for tissue culture, 197
  isolated perfused, respiratory changes after freeze-thaw and hypothermic storage, 140
Kinetics, permeation, of glycerol and dimethyl sulfoxide in Novikoff hepatoma ascites cells, 1

Lactobacillus bifidus, survival after freeze-drying, 30
Lactobacillus leichmannii, effect of freezing and thawing on cellular function, 174
Leukemia
  low temperature preservation of chronic myelogenous cells, 47
  spleen colony assay of survival of frozen-thawed L1210 cells, 333
Leukocyte processes, stability to freeze-thawing, 209

Microbial aerosols, behavior at −30°C, 337
Mitochondrial enzyme assay, mechanism of freezing damage to mouse liver, 283
Mucopolysaccharides of erythrocytes, cryotolerance, 295

Novikoff hepatoma ascites cells, permeation kinetics of glycerol and dimethyl sulfoxide, 1
Nucleic acids, seasonal changes related to cold hardiness of alfalfa, 11
Nutrient media storage of human bone marrow, 204

Opossums, pouch-young, temperature, weight, and resistance to asphyxia, 24

pH, tissue, seasonal changes related to cold hardiness of alfalfa, 11
Plant cells, survival at super-low temperature by rapid cooling and rewarming, 165
Preservation, low temperature (*see also* Cryopreservation)
  chronic myelogenous leukemia cells, 47
  human bone marrow in nutrient media, 204
Pressure, high, apparatus for transferring and freezing tissue under, 329
Protein
  chicken myofibrillar, cryodenaturation, 184
  foreign, hypothermic stress in rats challenged with, 232
  soluble, seasonal changes related to cold hardiness of alfalfa, 11

Seasonal changes, cold hardiness of alfalfa, 11
Spermatozoa, biochemical changes due to freezing, 75
Spleen colony assay, survival of frozen-thawed L1210 cells, 333
Storage (*see* Cryopreservation and Preservation, low temperature)
Stress, hypothermic, in rats challenged with foreign protein, 232

Thawing
  Lactobacillus leichmannii, 174
  rapid, of plant cells, 165
  uterus, with glycerol, 147
Thiogel, effect of cryoprotective agents on intermolecular SS formation during freezing, 85
Tissue culture cells, short-term storage in Dry Ice after earlier storage in liquid nitrogen vapor, 237
Tumors
  cryotherapy for malignant, 33
  various solid and ascites, viability after prolonged storage at −78°C, 177

Ultrastructure
  cellular, assessment of freeze-thaw-induced injury, 61
  of frozen tissues, freeze-cleave approach, 116
Uterus, freezing and thawing with glycerol, 147

Viability assay
  at organ functional level, 130
  histochemical enzyme procedures, 136
  tissues and organs, 103, 104, 133, 137
Vesicular stomatitis virus, cryobiological characteristics, 223

CRYOBIOLOGY

EDITORIAL BOARD

Radoslav K. Andjus
Hendrick B. Barner
Mary E. Burns
John A. Cavins
Clement W. Cowley
Owen Fennema
G. Edgar Folk, Jr.
Rowdon M. Fry
Isidore Gersch
George O. Gey
Ian W. D. Henderson
Thomas D. Kellaway
Robert G. Kindred
C. T. Knorpp
Tokio Nei
Peter Mazur
John W. McTigue
Thomas Nash
Joseph A. Panuska
Maxim D. Persidsky
Gabriel L. Rapatz
Paolo Rossotta
Robert Schrek
Kenneth W. Sell
Frank E. South, Jr.
Harold L. Stewart
Oscar Thorup
Frank E. Trobaugh
Monroe M. Vincent

Editor-in-Chief: Theodore I. Malinin

Associate Editor: Vernon P. Perry

Abstracts Editor: Arthur Rowe

Volume 4, 1967–1968

SOCIETY FOR CRYOBIOLOGY

Copyright © 1968

VOLUME CONTENTS

No. 1, July–August 1967

Permeation Kinetics of Glycerol and Dimethyl Sulfoxide in Novikoff Hepatoma Ascites Cells ..... I. J. Bickis, K. Kazaks, J. J. Finn, and I. W. D. Henderson 1
Seasonal Changes in Soluble Protein, Nucleic Acids, and Tissue pH Related to Cold Hardiness of Alfalfa ..... G. A. Jung, S. C. Shih, and D. C. Shelton 11
Factors Affecting the Viability of Lyophilized Algae ..... Osmund Holm-Hansen 17

BRIEF COMMUNICATIONS

Temperature, Weight (= Age), and Resistance to Asphyxia in Pouch-Young Opossums ..... Richard Rink and James A. Miller, Jr. 24
Survival of *Lactobacillus bifidus* after Freeze-Drying
Vladimir Damyanovich and Draginja Radulović 30
Cryotherapy for Malignant Tumors
James Blackwood, Fred T. Moore, and William G. Pace 33
ABSTRACTS OF INTEREST 39

No. 2, September–October 1967

Low Temperature Preservation of Chronic Myelogenous Leukemia Cells—A Method and Review ..... Stephen B. Shohet and William C. Mohler 47
Correlation of Cellular Ultrastructure before Freezing, while Frozen, and after Thawing in Assessing Freeze-Thaw-Induced Injury
J. K. Sherman and K. S. Kim 61
Some Biochemical Changes in Spermatozoa Due to Freezing
E. F. Graham and M. M. Pace 75

BRIEF COMMUNICATIONS

The Effect of Cryoprotective Agents on Intermolecular SS Formation during Freezing of Thiogel ..... Sharron Andrews and J. Levitt 85
Toxicity of Dimethyl Sulfoxide on HeLa Cells
Theodore I. Malinin and Vernon P. Perry 90
The Treatment of Chronic Cervicitis by Cryotherapy
Donald R. Ostergard, Duane E. Townsend, and Frank M. Hirose 97

No. 3, November–December 1967

SYMPOSIUM—VIABILITY ASSAY OF TISSUES AND ORGANS

Introductory Remarks ..... Arthur P. Callahan 103
A Review of Tissue and Organ Viability Assay
Theodore I. Malinin and Vernon P. Perry 104
The Freeze-Cleave Approach to the Ultrastructure of Frozen Tissues
Ronald S. Weinstein and Kuniyuki Someda 116
Viability Assay at the Organ Functional Level ..... Watts R. Webb 130
Discussion
Viability Assay of Organized Tissues and Organs ..... Kenneth W. Sell 133
Histochemical Enzyme Procedures in Viability Assay of Tissues and Organs
P. J. Melnick 136
Viability Assay of Tissues and Organs ..... J. K. Sherman 137
Respiratory Changes in Isolated Perfused Rat Kidneys after Freeze-Thaw and Hypothermic Storage ..... M. D. Turner, H. R. Pitts, and A. C. Turner 140

BRIEF COMMUNICATIONS

Changes in Rat Uterus Caused by Freezing and Thawing in the Presence of Glycerol ..... P. M. Carroll and J. H. Lin 147

Mechanism of Hemolysis of Erythrocytes by Freezing at Near-Zero Temperatures. I. Microscopic Observation of Hemolyzing Erythrocytes during the Freezing and Thawing Process ..... Tokio Nei 153

The Effect of Dimethyl Sulfoxide on Heart Rate and Cardiac Arrest in Unanesthetized Rats during Progressive Hypothermia
J. A. Panuska, J. Perez-Colon, and R. P. Banka 157

Financial Statements 162

No. 4, January–February 1968

Mechanism of Survival in Plant Cells at Super-Low Temperatures by Rapid Cooling and Rewarming ..... A. Sakai, K. Ōtsuka, and S. Yoshida 165

The Effect of Freezing and Thawing on Cellular Function in *Lactobacillus leichmannii* ..... E. M. Stapert and W. T. Sokolski 174

Viability of Various Solid and Ascites Tumors after Prolonged Storage at −78°C
Kanematsu Sugiura, Anthony J. Tortolani, and Mary Gay Sargent 177

BRIEF COMMUNICATIONS

On Cryodenaturation of Chicken Myofibrillar Proteins
A. E. Khan, E. Davidkova, and L. van den Berg 184

Ultrastructural Characteristics and Behavior of Previously Frozen, Glycerolyzed and Deglycerolyzed Human Red Blood Cells
Gwendolyn J. Stewart and Henri M. Turner 189

Some Optimal Observations in Freezing Rabbit Kidney Cells for Tissue Culture
André Chagnon, Bertrand Couture, and Vytautas Pavilanis 197

Pulsatile Activity of Isolated Heart Muscle Cells after Freezing Storage
E. Schöpf-Ebner, W. O. Gross, and O. M. Bucher 200

Nutrient Media Storage of Human Bone Marrow
Vernon P. Perry, Arthur M. Pappas, Thomas E. Wheeler, and Charles E. Brodine 204

Stability of Human Leukocyte Processes to Freeze-Thawing
David Kessel, Susan Blakely, John A. Cavins, Vivienne Botterill, and Thomas C. Hall 209

Abstract of Interest 212

No. 5, March–April 1968

Combined Effects of Freezing Rates and of Various Protective Agents on the Preservation of Human Erythrocytes ..... G. Rapatz and B. Luyet 215

Comparison and Cryobiological and Freeze-Drying Characteristics of Foot and Mouth Disease Virus and of Vesicular Stomatitis Virus ..... O. N. Fellowes 223

BRIEF COMMUNICATIONS

Hypothermic Stress in Animals Challenged with Foreign Protein
Charles F. Geschickter 232

Short-Term Storage in Dry Ice of Tissue Culture Cells Previously Stored in Liquid Nitrogen Vapor ..... P. J. Price, V. F. Bray, and A. E. Freeman 237

FIFTH ANNUAL MEETING OF THE SOCIETY FOR CRYOBIOLOGY

Program Schedule 241

Abstracts

Presentation of Contributed Papers 247

Symposium I. Environmental Cryobiology 259

Symposium II. Cryosurgery 260

Fourth Cryopreservation Conference—Heart and Kidney 267

Scientific Exhibit Abstracts 278

Index of Authors of Abstracts 280

No. 6, May–June 1968

Studies on the Mechanism of Freezing Damage to Mouse Liver Using a Mitochondrial Enzyme Assay. I. Temporal Localization of the Injury Phase during Slow Freezing ..... William N. Fishbein and Robert E. Stowell 283

Protective Effect of Ethyl Alcohol in Profound Hypothermia
Watts R. Webb, Norman Harrison, Ross Dodds, Stennis D. Wax, and Winfred L. Sugg 290

Cryotolerance of Selected Sites on the Surfaces of Membranes of Cells. I. Mucopolysaccharides of Erythrocytes ..... Donald Greiff and Peter Seifert 295

Mechanism of Hemolysis of Erythrocytes by Freezing at Near-Zero Temperatures. II. Investigations of Factors Affecting Hemolysis by Freezing ..... Tokio Nei 303

Alterations during the Repair of Injury Induced by Gastric Freezing
J. V. Klavins, W. W. Shingleton, and R. L. Fuson 309

Ultrastructural Modifications of the Intercalated Disc during Hypothermia in the Rat and the Ground Squirrel
Marilyn L. Zimny, Maurice Sherman, and Carole C. Romano 317

BRIEF COMMUNICATIONS

Apparatus for Transferring and Freezing Tissue under High Pressure
G. Van Hulle, O. Fennema, and W. D. Powrie 329

Spleen Colony Studies of Leukemia L1210. VI. Quantitation of the Surviving Population of Frozen-Thawed L1210 Cells Using the Spleen Colony Assay
Isidore Wodinsky, Craig Foley, and C. J. Kensler 333

Behavior of Microbial Aerosols in a −30°C Environment
William D. Won and Harold Ross 337

PROCEEDINGS OF THE SECOND CRYOPRESERVATION CONFERENCE

Review of the Literature on Cryopreservation of Bone. ..... Philip J. Boyne 341

Current Methods of Bone Storage by Freezing and Freeze-Drying
Arthur M. Pappas 358

INDEX 377

VOLUME CONTENTS iii